

epd square .



Environmental Product Declaration

Average EPD

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

Debris Flow Barriers

TRUMER Schutzbauten GmbH



Programme

EPD Square | www.epdsquare.com

Programme operator

EPD Square, s.r.o.

EPD Registration number

SQ 00-013

Publication date

06.11.2024

Valid until

05.11.2029

General information

Product

Debris Flow Barriers

Program operator

EPD Square

Karadžičova 16, 811 09, Bratislava, Slovakia

Email: info@epdsquare.com

Registration number

SQ 00-013

Publication date

06.11.2024

Valid until date

05.11.2029

Owner of the declaration

Trumer Schutzbauten GmbH

Contact person: Marco Papillion

Email: marco.papillion@trumer.cc

Manufacturer

Trumer Schutzbauten GmbH

Maria-Bühel-Strasse 7,

A-5110 Oberndorf, Austria

Email: office@trumer.cc

Place of production

Handelsstrasse 6,

A-5162 Obertrum am See,

Austria

Product Category Rules (PCR)

The CEN standard EN 15804+A2 serves as the core PCR.
In addition, EPD Square PCR v1.0, 2024 is used.

Declared

kg

Mass per DU

1 kg

UN CPC code

532 – Civil engineering works

Geographical scope

Europe

Year of study

Data representative of 2023

Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in the context of the building.

EPD author

Sarah Curpen, Silvia Vilčeková

Verification type

Independent verification of the declaration and data,
according to ISO14025:2006

Internal: ☐

External: ☒

Verified by

Eng. Shai Ben Aharon



The owner of the declaration shall be liable for the underlying information and evidence.

EPD Square shall not be liable with respect to manufacturer, life cycle assessment data and evidence.

System boundaries

Cradle to gate with additional modules. That is modules A1-A3, C1-C4, D and additional modules A4-A5 are declared.

Modules declared and geographical scope

	Product stage			Construction process stage		Use stage								End of life stage			Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	✓	✓	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓	✓
Geography	EU/A S	EU/A S	AT	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU

The table is adapted for physical products and may have to be modified when declaring service products.

Description of Organization

TRUMER Schutzbauten GmbH was founded in the early 1990s near Salzburg, Austria. At the time TRUMER worked closely alongside construction companies and stakeholders to help solve their geohazard mitigation needs. It quickly became apparent that there was much room for improvement with regards to installation efficiency, system functionality and cost of rockfall catchment fences available on the market.

In response, a unique net was developed, which was tested and proven to have lasting effects on the geohazards industry. The Omega-Net was the first high-strength net brought to the market with the strength, deformation capabilities and functional attributes to make the installation of large capacity systems a simple effort. Topping the list was its ability to fold into compact packages that could be easily transported in combination with posts by helicopter or cranes and installed without any shackles or sewing ropes. This removed the need to heave nets into position during installation.

The product spectrum of TRUMER has grown to include systems for mitigating unstable slopes (both passive and active measures), shallow landslide and debris flow mitigation and avalanche protection. TRUMER has also expanded the reach far beyond the borders of Austria to across the world, building a name on quality products known for their robustness and high level of safety.

Product information

Product name

Debris Flow Barriers

Product description

The Debris flow barriers are flexible net systems typically constructed in channel perpendicular to the flow direction. A simple gully net is often sufficient for narrow spans (e.g. less than 15 m), whereas a post and net system is required for wide channels or open-slope applications. The primary net material used in TRUMER systems is called the Omega-Net. It is a steel cable net made from spiral rope that has thick individual wires to resist abrasion. The strands of rope are pre-bent into arcs resembling an omega shape and then woven together to make the net. This process yields an extremely strong net with high flexibility and energy absorption characteristics. The AVT-phx series of brake elements are steel coils that unravel when a force is applied. The gauge, width and number of coils can be specified in order to control the amount of energy absorbed and the total displacement. With no moving parts, these are some of the safest and most reliable brake elements in the industry.

Product application

Debris Catchers – TS-DC-Gully Net/Delta/Lambda

The TS-DC Gully Net is a debris flow barrier designed for sites with confined flows such as in gullies or debris torrents. The TS-DC Delta is a debris flow barrier designed for large and difficult loading conditions. The TS-DC Lambda is a debris flow barrier designed for the highest and most difficult loading conditions. Unlike prefabricated systems used for rockfall mitigation, debris flow barriers must always be designed on a site-to-site basis to account for the highly variable characteristics of debris flow processes and their interaction with site topography. A double rope system is used to ensure the net remains as close to the edge embankments as possible while allowing the brake elements to expand. In this case, a brake element is fitted to opposing sides of the ropes. The side with the brake element is not threaded through the leading net panel.

Shallow Landslide Barriers – TS-HM-150-ZD

TRUMER developed shallow landslide protection systems to protect infrastructure, utilities, buildings and lives from sliding or flowing shallow landslide debris. Typical are installed in run-out or deposition zones, close to the elements at risk that they protect. The TS-HM-150-ZD can absorb energy greater of 5000 kJ created by shallow landslides.

Hinged Post System – Modified Rockfall fence

The Hinged Post System – Modified Rockfall Fence is an advanced barrier designed to mitigate rockfall hazards. It features hinged posts that allow for controlled deflection upon impact, enhancing energy absorption and reducing structural damage. The system combines high-tensile wire mesh with robust anchor points for increased durability and reliability. Suitable for various terrains, it is engineered to withstand significant dynamic loads. Ideal for protecting infrastructure and roadways in mountainous or rocky areas, it offers an efficient solution for rockfall protection.

Standards:

GEO REPORT NO. 309: A PRELIMINARY STUDY ON IMPACT OF LANDSLIDE DEBRIS ON FLEXIBLE BARRIERS (2015)

ONR 24801: PROTECTION WORKS FOR TORRENT CONTROL – STATIC AND DYNAMIC ACTIONS ON STRUCTURES (2013)

DN 1/2012: SUGGESTIONS ON DESIGN APPROACHES FOR FLEXIBLE DEBRIS-RESISTING BARRIERS (2012)

ONR 24802: PROTECTION WORKS FOR TORRENT CONTROL – DESIGN OF STRUCTURES (2011)

ONR24803: PROTECTION WORKS FOR TORRENT CONTROL – OPERATION, MONITORING, MAINTENANCE (2008)

Geographical scope

Europe

Technical Characteristics of Debris flow barriers

Product	Available Height
TS-DC Gully Net/ Delta/Lambda	up to 7.5 m
Shallow Landslide	up to 3.5 m

The detailed list of debris flow systems and their corresponding technical parameters are available at:

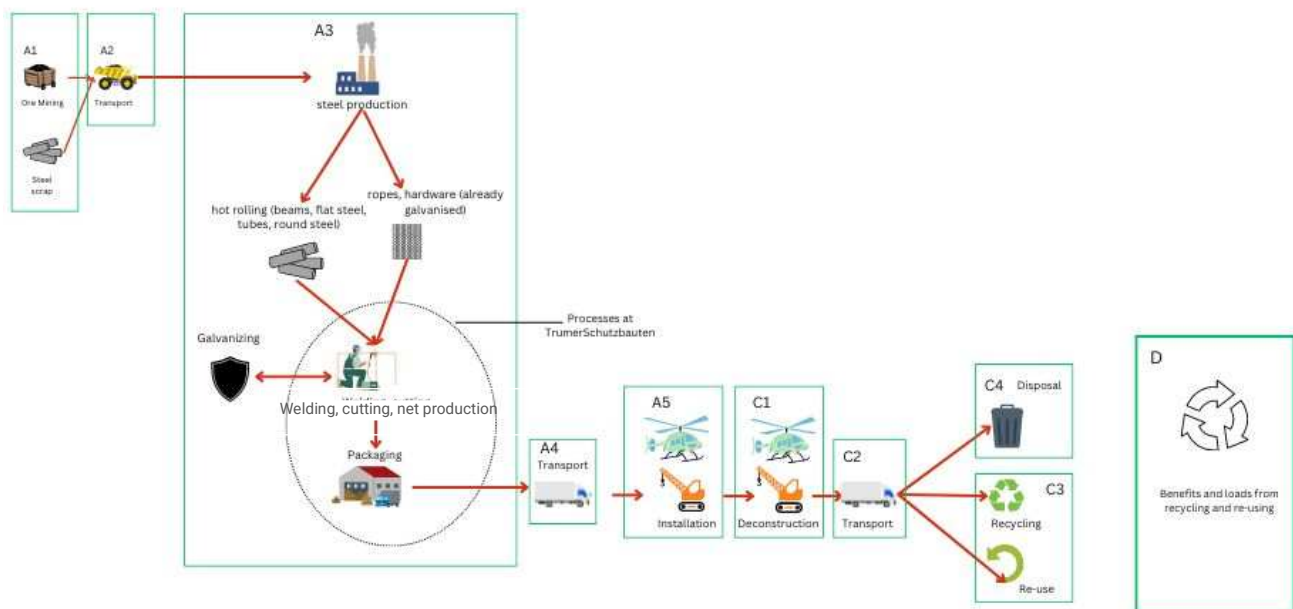
<https://trumerschutzbauten.com/debris-flow-barriers/>

Product contents information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Steel	0.987	52	[-]
Coating	0.013	0	
TOTAL	1.0	51	
Packaging materials	Weight, kg	Weight-% (versus the product)	
Carton	0.000022	0.0022	
Plastic	0.0000031	0.00031	
Wood Reels	0.01	1	
Wooden Pallets	0.00548	0.55	

Manufacturing process (A1-A3)

The manufacturer gathers steel components which are made from primary steel (48%) and recycled steel (52%). The raw material (steel section, zinc) is transported to the manufacturing location. The sections are cut to required length using bandsaw, straightened, pierced, punched through power press, welded and outsourced to approved vendor for galvanization. The raw material is iron ore which is mined and then processed into different steel components. The manufacturer does not mine for the primary materials but imports steel parts (beams, flat steel, wire ropes, etc.) that are already processed. The different steel parts are brought to the manufacturing plant where they are processed. The different steel components are brought by sea freight and truck. The different steel components are processed at the assembly plant where they are folded, cut, welded and assembled to form the debris flow systems. They are packed with plastic tape, placed on wooden pallets and secured by wooden reels before being loaded on trucks for delivery.



The final products consist of various modular components, which are manufactured and assembled at the construction site. Typically, the main components are:

- **Rope Net:** Rope strands are made from galvanized steel and shaped by machine. The weaving and packaging processes are done manually.
- **Ropes:** Each system uses ropes as a bearing and connection structure. The ropes are purchased in bulk, then cut and pressed to fit the project requirements.
- **Steelworks:** Each system uses posts and base plates made from steel. Beams, tubes, and plates are purchased, with cutting, drilling, and welding done at the manufacturing plant. Galvanization is outsourced.
- **Brake Elements:** Energy-absorbing elements made from steel and then galvanized

This streamlined process ensures quality and precision in every component.

Life cycle assessment (LCA)

Cut-off criteria

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Allocation, estimations, and assumptions

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 tonne of the products which are used within this study are calculated by considering the total product weight per annual production. In the production plant, several kinds of products are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total energy consumption, packaging materials and the generated waste per the declared product are allocated. Subsequently, the produced products output fixed to 1 tonne and the corresponding amount of product is used in the calculations.

Database(s) and LCA software

This EPD has been created using One Click LCA Pre-Verified EPD Generator. Ecoinvent v3.8 and One Click LCA databases were used as sources of environmental data.

LCA scenarios and additional environmental information

The following information describes scenarios in different modules of the EPD.

Manufacturing A3

Manufacturing energy scenario

Electricity data source and quality	Austria, residual mix
Electricity CO2e / kWh	0.2
Energy data source and quality	LCA study for country specific electricity mixes based on IEA, OneClickLCA 2024
Heating CO2e / MJ (Natural gas)	0.0781
Energy data source and quality	Ecoinvent 3.8
Heating CO2e / MJ (Biomethane)	0.013
Energy data source and quality	Ecoinvent 3.8
Heating CO2e / MJ (Fuel)	0.088
Energy data source and quality	Ecoinvent 3.8
Heating CO2e / MJ (Coal)	0.062
Energy data source and quality	Ecoinvent 3.8
Heating CO2e / MJ (Municipal waste incineration)	-
Energy data source and quality	Ecoinvent 3.8

Transportation scenario (A4)

Transportation impacts that occurred from final product delivery to the construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The transport distances to various delivery sites are based on delivery records for 2023.

Vehicle type used for transport	Truck>32 ton, euro 6

Assembly (A5)

The installation of the debris flow barriers requires lifting and transportation by helicopter or crane. Either method is used 50% of the time. The helicopter time required for installation is estimated to be 360 kg/min and for crane 240 kg/min.

Use Phase (B1-B7)

The modules for use phase (B1-B7) are not included in the LCA.

End of Life (C1, C2, C3, C4)

The debris flow barriers are de-constructed by similar methods as its installation that is by helicopter and crane. The different steel parts are then taken to different treatment facilities located 50 km away by trucks. The steel ropes and strands of the debris flow barriers can be reused. They are taken to a treatment facility for re-use. The other steel parts of the debris flow barriers are transported to a recycling facility.

	Value	Unit
Collected separately	-	Kg
Collected as mixed construction waste	-	Kg
Reuse	0.41	Kg
Recycling	0.54	Kg
Energy recovery	-	Kg
To landfill	-	Kg

Benefits and Burdens beyond boundary system (D)

95% of the steel product is considered for recovery in module D.

LCA results

Declared unit: 1kg. The results presented below are given per declared unit.

Mandatory impact category indicators – EN 15804+A2, PEF 3.0

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1.30E+00	9.34E-02	4.55E-01	1.84E+00	1.34E-01	9.27E-02	3.89E-02	2.49E-02	5.47E-02	2.64E-04	-2.47E-01
GWP-fossil	kg CO ₂ eq.	1.29E+00	9.33E-02	3.77E-01	1.76E+00	1.34E-01	3.92E-02	3.89E-02	2.48E-02	5.47E-02	2.63E-04	-2.49E-01
GWP-biogenic	kg CO ₂ eq.	2.80E-03	3.19E-05	7.74E-02	8.02E-02	5.43E-05	5.34E-02	2.61E-05	1.13E-05	-2.00E-03	-1.06E-04	1.26E-03
GWP-LULUC	kg CO ₂ eq.	2.56E-03	5.23E-05	5.27E-05	2.66E-03	5.36E-05	1.05E-05	1.00E-05	1.17E-05	5.44E-06	2.49E-07	4.43E-04
ODP	kg CFC11 eq.	8.21E-08	1.95E-08	3.50E-08	1.37E-07	3.10E-08	6.86E-08	6.86E-08	5.60E-09	1.17E-08	1.07E-10	-2.66E-09
AP	mol H ⁺ eq.	1.55E-02	1.45E-03	2.29E-03	1.93E-02	3.81E-04	4.88E-04	4.87E-04	7.04E-05	5.68E-04	2.48E-06	-4.67E-04
EP-freshwater	kg P eq.	7.63E-05	6.16E-07	4.38E-05	1.21E-04	9.57E-07	3.06E-07	2.84E-07	2.03E-07	1.81E-07	2.76E-09	6.46E-06
EP-marine	kg N eq.	1.48E-03	3.55E-04	3.82E-04	2.21E-03	7.59E-05	6.15E-05	6.13E-05	1.34E-05	2.51E-04	8.57E-07	1.53E-04
EP-terrestrial	mol N eq.	5.76E-02	3.94E-03	6.85E-03	6.83E-02	8.44E-04	6.74E-04	6.72E-04	1.50E-04	2.76E-03	9.43E-06	-2.22E-03
POCP	kg NMVOC eq.	5.74E-03	1.06E-03	1.16E-03	7.96E-03	3.24E-04	2.77E-04	2.76E-04	5.75E-05	7.58E-04	2.74E-06	-1.82E-03
ADP-M&M	kg Sb eq.	7.31E-05	2.51E-07	2.51E-07	7.57E-05	4.85E-07	4.28E-08	4.17E-08	1.16E-07	2.77E-08	6.05E-10	1.19E-06
ADP-fossil	MJ	1.43E+01	1.28E+00	5.19E+00	2.08E+01	1.99E+00	4.05E+00	4.04E+00	3.66E-01	7.36E-01	7.22E-03	-1.31E+00
WDP	m ³	6.97E-01	5.09E-03	1.59E+00	2.30E+00	9.33E-03	5.05E-03	4.93E-03	1.91E-03	1.98E-03	2.29E-05	2.09E-01

GWP-total: Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional requirements" for indicator given as PO₄ eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional voluntary impact category indicators – EN 15804+A2, PEF 3.0

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	1.81E-07	5.79E-09	1.12E-08	1.98E-07	1.08E-08	2.72E-09	2.70E-09	1.70E-09	1.52E-08	4.99E-11	-3.33E-09
IRP	kBq U235 eq.	7.88E-02	5.96E-03	3.32E-03	8.81E-02	1.05E-02	1.83E-02	1.82E-02	1.98E-03	3.38E-03	3.27E-05	2.80E-02
ETP-fw	CTUe	6.79E+01	1.04E+00	3.22E+00	7.22E+01	1.66E+00	2.18E+00	2.17E+00	3.17E-01	4.42E-01	4.71E-03	-2.46E+00
HTP-c	CTUh	6.71E-09	4.44E-11	9.71E-11	6.85E-09	5.12E-11	1.58E-11	1.56E-11	1.10E-11	1.69E-11	1.18E-13	5.46E-09
HTP-nc	CTUh	4.75E-08	8.67E-10	2.49E-09	5.09E-08	1.63E-09	4.69E-10	4.65E-10	2.97E-10	3.20E-10	3.08E-12	3.20E-08
SQP	Dimensionless	3.98E+00	6.84E-01	8.72E-01	5.54E+00	1.42E+00	4.88E-01	4.86E-01	2.20E-01	9.56E-02	1.54E-02	-1.60E-01

PM: Particulate matter emissions; IRP: Ionising radiation, human health; ETP-fw: Ecotoxicity (freshwater); ETP-c: Human toxicity, cancer effects; HTP-nc: Human toxicity, non-cancer effects; SQP: Land use related impacts / soil quality

Resource use indicators

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	1.01E+00	1.32E-02	5.83E+00	6.85E+00	2.90E-02	9.18E-03	8.41E-03	6.29E-03	4.20E-03	6.27E-05	2.62E-01
RPEM	MJ	0.00E+00	0.00E+00	1.47E-01	1.47E-01	0.00E+00	-8.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	1.01E+00	1.32E-02	5.98E+00	7.00E+00	2.90E-02	-7.78E-02	8.41E-03	6.29E-03	4.20E-03	6.27E-05	2.62E-01
NRPE	MJ	1.43E+01	1.28E+00	5.18E+00	2.08E+01	1.99E+00	5.12E-01	5.06E-01	3.66E-01	7.36E-01	7.22E-03	-1.31E+00
NRPM	MJ	0.00E+00	0.00E+00	3.99E-03	3.99E-03	0.00E+00	3.53E+00	3.53E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRPE	MJ	1.43E+01	1.28E+00	5.19E+00	2.08E+01	1.99E+00	4.05E+00	4.04E+00	3.66E-01	7.36E-01	7.22E-03	-1.31E+00
SM	kg	1.23E-01	4.98E-04	5.22E-04	1.24E-01	6.79E-04	1.57E-04	1.54E-04	1.50E-04	2.88E-04	1.52E-06	2.72E-01
RSF	MJ	5.29E-05	4.05E-06	4.59E-03	4.65E-03	7.47E-06	1.20E-06	1.19E-06	1.74E-06	9.41E-07	3.96E-08	1.93E-05
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m ³	1.53E-02	1.30E-04	6.86E-04	1.61E-02	2.54E-04	1.06E-04	1.03E-04	5.14E-05	4.47E-05	7.90E-06	-1.02E-02

RPEE: Renewable primary energy resources used as energy carrier; RPEM: Renewable primary energy resources used as raw materials; TPE: Total use of renewable primary energy resources; NRPE: Non-renewable primary energy resources used as energy carrier; NRPM: Non-renewable primary energy resources used as materials; TRPE: Total use of non-renewable primary energy resources; SM: Use of secondary materials; RSF: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels; W: Use of net fresh water

Waste indicators

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	2.45E-01	1.85E-03	8.13E-03	2.55E-01	2.27E-03	9.39E-04	9.20E-04	4.76E-04	0.00E+00	0.00E+00	1.85E-02
NHW	kg	2.39E+00	2.43E-02	2.90E-01	2.71E+00	4.03E-02	1.16E-02	1.06E-02	8.62E-03	0.00E+00	5.00E-02	-3.09E-01
RW	kg	3.48E-05	8.69E-06	3.85E-06	4.73E-05	1.37E-05	2.93E-05	2.93E-05	2.49E-06	0.00E+00	0.00E+00	8.03E-06

HW: Hazardous waste disposed; NHW: Non-hazardous waste disposed; RW: Radioactive waste disposed

Output flow indicators

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.10E-01	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	1.12E-02	1.12E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.40E-01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CR: Components for reuse; MR: Materials for recycling; MER: Materials for energy recovery; EEE: Exported electric energy; ETE: Exported thermal energy

Environmental impacts – GWP-GHG

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - GHG	kg CO2e	1.29E+00	9.33E-02	3.77E-01	1.76E+00	1.34E-01	3.92E-02	3.89E-02	2.48E-02	5.47E-02	2.63E-04	-2.49E-01

GWP- GHG: Global Warming Potential, greenhouse gases

Information describing biogenic carbon content at factory gate

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	[]-	kg C
Biogenic carbon content in the accompanying packaging	0.026	kg C

Specific data (GWP-GHG) and data variation for A1-A3

Specific data and data variation	
Specific data	<60%
Variation - product	<10%
Variation - site	Not relevant

Hazardous substances

☒ The product does not contain any REACH SVHC substances in amounts greater than 0.1 %.

Contact information

Programme operator

EPD Square

Karadžičova 16, 811 09, Bratislava, Slovakia

Email: info@epdsquare.com

EPD owner

Trumer Schutzbauten GmbH

Contact person: Marco Papillion

Email: marco.papillion@trumer.cc

Author of Life Cycle Assessment (LCA)

Sarah Curpen, Silvia Vilčeková, SALVIS s.r.o

Email: curpen@salvis.sk, vilcekova@salvis.sk

EPD verifier

Eng. Shai Ben Aharon, KVS

Email: shai@kvs.co.il

Bibliography

ISO 14020:2000

Environmental labels and declarations – General principles

ISO 14025:2010

Environmental labels and declarations - Type III environmental declarations - Principles and procedures

ISO 14044:2006

Environmental management - Life cycle assessment - Requirements and guidelines

EN 15804:2012+A2:2019

Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

EPD Square PCR v.1.0, 2024

EPD Square, General Programme Instructions v.1, 2024

Ecoinvent database v3.8 (2021) and One Click LCA database

Environmental product declaration. High Tensile chain link mesh. Brugg Geobrugg. EPD International AB. S-P-06298. 2024.

Annex

Environmental impacts – EN 15804+A1, CML/ISO 21930

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO ₂ eq.	1.24E+00	9.25E-02	3.79E-01	1.71E+00	1.33E-01	3.82E-02	3.78E-02	2.46E-02	5.41E-02	2.58E-04	-2.20E-01
ODP	kg CFC11 eq.	7.99E-08	1.54E-08	2.76E-08	1.23E-07	2.46E-08	5.42E-08	5.42E-08	4.45E-09	9.25E-09	8.43E-11	-9.37E-09
AP	kg SO ₂ eq.	9.78E-03	1.16E-03	1.66E-03	1.26E-02	3.12E-04	4.19E-04	4.18E-04	5.80E-05	4.05E-04	1.87E-06	-3.29E-04
EP	kg PO ₄ eq.	3.85E-03	1.46E-04	4.59E-04	4.45E-03	6.74E-05	5.05E-05	4.96E-05	1.31E-05	9.39E-05	4.03E-07	-2.14E-04
POCP	kg C ₂ H ₄ eq.	5.60E-04	3.29E-05	7.27E-05	6.65E-04	1.58E-05	1.67E-05	1.67E-05	2.96E-06	8.86E-06	7.84E-08	-2.72E-04
ADP-M&M	kg Sb eq.	7.29E-05	2.45E-07	2.29E-06	7.54E-05	4.73E-07	4.16E-08	4.05E-08	1.13E-07	2.73E-08	5.96E-10	1.17E-06
ADP-fossil	MJ	1.43E+01	1.28E+00	5.19E+00	2.08E+01	1.99E+00	4.05E+00	4.04E+00	3.65E-01	7.36E-01	7.22E-03	-1.31E+00

GWP: Global Warming Potential; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional requirements" for indicator given as PO₄ eq. **EP:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **POCP:** Formation potential of tropospheric ozone; **ADP-non fossil:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources;